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ABSTRACT

To relate scientific evidence with subjective interpretations relevant to the construction and appreciation of visual images, this paper reviews the literature pertinent to the processes involving the perception of visual images, the distinct functions of the left and right hemispheres of the human brain in recording and interpreting visual data, the physiological properties of television images, and the compositional factors that determine the effective structure of television images. The paper concludes that the construction of significant theories on television aesthetics, insofar as viewers' perception, interpretation, and response are concerned, should be based on empirical research that relates scientific findings (studies on visual perception, neurology, and physiology) with subjective interpretations (studies on visual communication and art composition). Such research, it contends, will bridge the gap between factual information and intuitive choices and will enhance the field of visual communication. (Author)

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VIEWERS' PERCEPTION OF TV IMAGES:
EMPIRICAL RESEARCH AND TELEVISION AESTHETICS

by

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ABSTRACT

In an attempt to relate scientific evidences with subjective interpretations relevant to the construction and appreciation of visual images, this paper reviews the literature pertinent to (1) the processes involving the perception of visual images, (2) the distinct functions of the left and right hemispheres of the human brain in recording and interpreting visual data, (3) the physiological properties of television images, and (4) the compositional factors that determine the effective structure of television images.

The conclusion reached is that construction of significant theories on television aesthetics insofar as viewers' perception, interpretation and response are concerned, should be based on empirical research that relates scientific findings (studies on visual perception, neurology and physiology) with subjective interpretations (studies on visual communication and art composition). Such research will bridge the gap between factual information and intuitive choices and will enhance the field of visual communication.

Scientific Evidence and Subjective Interpretation of Television Images

The public's growing dependence on television as a disseminator of information provides a greater need for research that determines the most efficient and effective means of visual and oral presentation.

Conventional research in television programming and the viewer - most of which deals with content analysis related issues - has now been enhanced with research that has little or nothing to do with program content. The new trend of research in visual communication concentrates on the relationship between the viewer and the screen. It deals with the ways the viewer perceives, interprets, and responds to television images. Such research studies involve at least four major disciplines: perceptual psychology, neurology, physiology, and art composition or aesthetics in an attempt to bridge scientific evidence with subjective interpretation.

Empirical research on perceptual psychology (Gibson, 1950, 1954, 1968, Murch, 1973), neurology (Bogen & Gazzaniga, 1965, Gazzaniga, 1967, Sperry, 1967, 1968, Sperry and Gazzaniga, 1969, Kimura, 1973, Orstein, 1973, etc.) and physiology (Crown, 1977, etc.) is often underestimated by researchers in visual communication and art composition (Arnheim, 1974, McKim, 1972, Zettl, 1973, Dondis, 1973, Parker & Drabic, 1974, Millerson, 1975, etc.). However, in order to establish sound theories on television aesthetics that will help to analyze the viewers' perception, interpretation and response to visual images, acknowledgement of the validity of empirical research in the above areas is paramount.

The constructors of visual messages, theatre directors, painters, photographers, filmmakers, television directors, etc., relying for the most part on their personal experiences and intuition have provided extensive literary sources underlining theories based on subjective descriptions. However, the systematic study of viewers' response to television images must consider the scientific grounds from which such responses derive. In short, the serious visual communication researcher must begin to challenge, verify, and empirically test the numerous subjective statements, intuitions, observations and comments written by the scholars and constructors of visual images.

Herein, an attempt will be made to review the literature found in four areas of research that relate the viewer's perception, interpretation and response to television images by entertaining the following questions:

1. What are the processes involved in the perception of visual messages?
2. How do each of the two hemispheres of the human brain process visual and auditory information?
3. How do the physiological properties of television images influence viewers' perception of those images?
4. What compositional factors determine the effective structure of TV pictures?

Important Perceptual, Neurological, Physiological and Compositional Factors in the Study of Viewers' Response to TV Images

1. What are the processes involved in the perception of visual messages?

In our efforts during the last four decades to construct, theorize and evaluate visual images, we have persistantly overlooked

important factors, key variables, underlined and studied by perceptual psychologists years ago. Herein, such key variables relevant to viewers' perception of visual images will be discussed.

Murch (1973, pp. 2 - 4) states that "any object or event which elicits a response can be considered as a stimulus for that response". He recognizes two types of stimuli: (1) distant stimulus which refers to the external object or event, and (2) proximal stimulus which refers to the sensory representation of the stimulus by the nervous system. Gibson (1967, pp. 64 - 68) also recognizes two types of stimuli which he calls "potential stimuli" and "effective stimuli". Any object, person, or event in the environment is a potential stimulus, whereas anytime that a potential stimulus stands in a constant relationship with a given response, it is an effective stimulus. In order to illustrate the process of visual perception based on the works of Gibson (1967) and Shiffrin and Atkinson (1969, pp. 179 - 183), Murch (1973, p. 64) developed a model of the perceptual process (Figure 1).

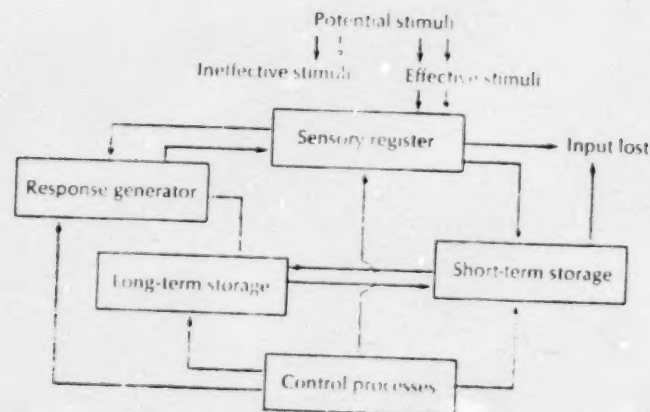


Figure 1. A model of the perceptual process(Murch, p.64)

He states that:

A potential stimulus may follow three possible pathways. First it may fail to gain entrance to the system and be relegated to the ineffectual stimuli category. Second, the stimulus may actually enter the sensory register but flow out to the input lost category. As one moves through a complex environment, many sights and sounds evoke momentary sensations that quickly pass out of the system. A third possible direction for a potential stimulus is to become an effective stimulus passing into the sensory register and on to short-term storage.

As constructors of visual images, we are often led to believe that our viewers will perceive, store, control and respond to all potential stimuli. Thus, our selection and recording of visual elements are careless and random.

This rather simplified way of explaining the process of visual perception is, in actuality, much more complicated since before an object becomes a stimulus, let alone an effective one, thinking is involved. Thinking, as an important variable in the process of visual perception, is often overlooked. Arnheim (1969, p. 1) contends that visual perception and thinking are two inseparable and related phenomena which work together, and warns that "...the collaboration of perceiving and thinking in cognition could be incomprehensible if such a division existed". This notion is supported and extended by Gibson (1950, p. 164) who suggests that in the process of visual perception one's own beliefs, background, drives, etc., are so strong that often one perceives what one wants to perceive. This led Derogowski (1973, pp. 22 - 28) and others to study and conclude that people from different cultures perceive pictures differently. It is paradoxical and ironic to believe (as networks, the public and even closed circuit television programmers do) that all American viewers perceive and interpret television images unilaterally and equally. Empirical research which takes these variables into account is either scarce or has not yet begun.

The lack of unanimity among viewers insofar as their perception of effective stimuli is concerned, coincides with the lack of empirical research that distinguishes how viewers perceive the phenomena randomly or purposefully exposed to the visual world as opposed to the viewers' perception of the same phenomena when they are purposefully reconstructed to appear in the visual field, the television screen. Important variables, decisive in the construction of TV images, and detrimental to viewers' perception of these images have long been ignored. Gibson (1950, pp. 42 - 43) has suggested a series of differences between ordinary objective seeing (the phenomena of the visual world) and pictorial seeing (phenomena appearing in the visual field) and underlined the characteristics of pictures as follows: (1) the field is bounded whereas the world is not; (2) the field can change in its direction depending on the viewers' position whereas the world cannot; (3) while the field is oriented in reference to its margins, the world is oriented in reference to gravity; (4) while the field is seen in perspective, the world is Euclidean; (5) objects in the world have depth-shape and are seen behind one another while forms in the concentrated field are depthless; (6) in the field, various shapes are deformed during locomotion whereas in the world everything remains constant and it is the observer who moves. These perceptual differences must be considered. The television picture is not the "thing as it is", but the "thing as such". It is only a window of the world, not the world itself (Figure 2).

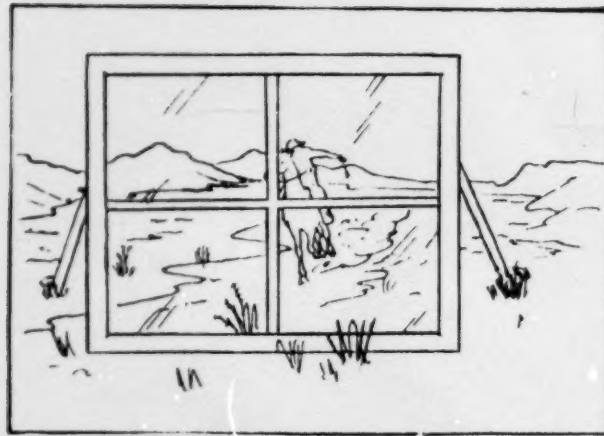


Figure 2. The Frame Line, a Window of the Story(Parker & Drabik p.69).

An additional characteristic of the visual field in terms of perception not mentioned by Gibson (1950) is its dimensions. The visual field is a window of the visual world, restricted to certain dimensions, often ignored by students of visual images. According to Stone & Collins (1965, pp. 503 - 506), our binocular visual field (see Figure 3) roughly extends to form a rectangle of 180° in length (horizontally seen) and 150° in height (vertically seen), and the rectangle created by such dimensions coincides with the golden section ($1:x = x:1-x$, or the extreme and mean ratio: the whole is to the large part as the large is to the smaller), which is regarded as having the most pleasing appearance. Although the implications of these findings are numerous, empirical studies on the aesthetic values of dimensions of the screen, as well as the important areas within the screen, are scarce.

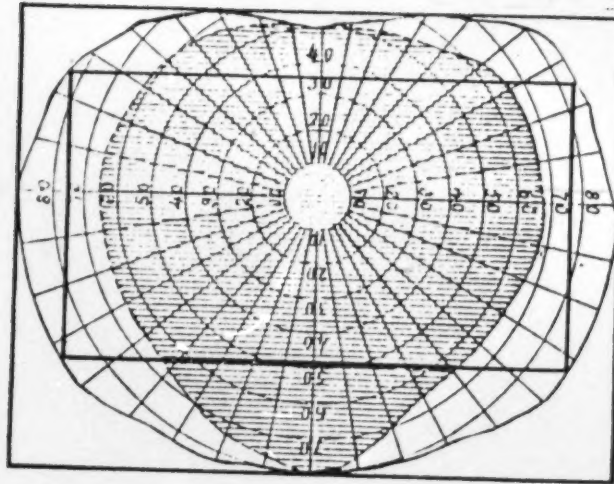


Figure 3. The Binocular Visual Field With Internal and External Rectangles(Stone & Collins, p.504).

While psychologists have conducted numerous experiments on the perceptual properties of light, color, shape, form, texture, etc., the researchers have neglected the empirical investigation of the above variables.

2. How do each of the two hemispheres of the human brain process visual and auditory information?

Studies of viewers' perception, interpretation and response to visual images, primarily television images, that overlook the scientific findings referring to the distinct functions of the left and right hemispheres of the human brain, are certainly inaccurate and incomplete. And the constructors, theorizers and evaluators of television images who ignore these neurological findings are building theories on television aesthetics which are misleading and unvarifiable.

Contrary to Goleman's (1977, pp. 89 - 15) critical statement that "the Split-Brain Psychology has become a fad of the year," the

study of television aesthetics must seriously consider these neurological findings dealing with the processing of visual images in the brain. (See Figure 4).

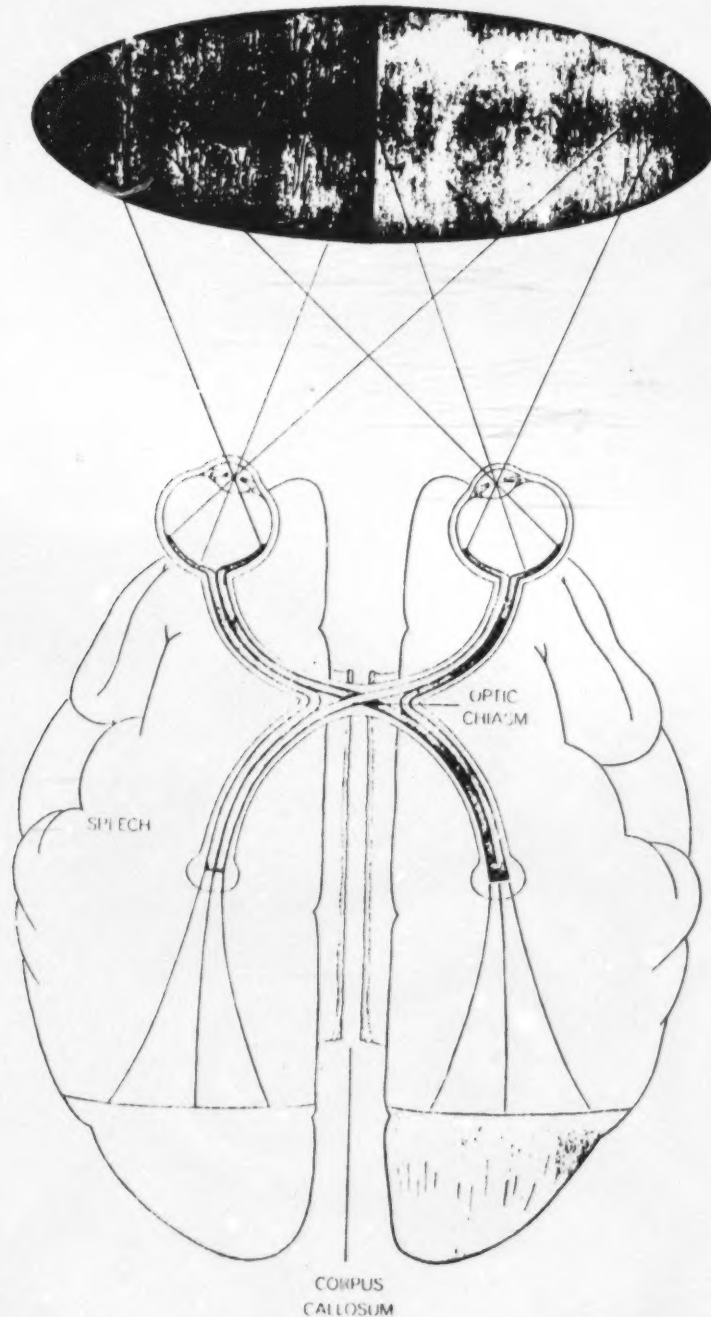


Figure 4. The Split-Brain in Man (Gazzaniga, p.25).

The left hemisphere of the human brain receives and interprets information from the right visual field, whereas the right hemisphere receives information coming from the left visual field. Although the corpus callosum (the vein that connects the two hemispheres) tends to distribute the visual information between the two halves of the brain, recent studies have shown that the two hemispheres function differently.

Orstein (1972, pp. 50 - 73) suggests that the left hemisphere is mostly involved with analytic, logical thinking, especially in verbal and mathematical thinking, whereas the right hemisphere is mostly involved in holistic mentation. The mode of operation of the left hemisphere is linear, processing information sequentially, underlined by thought, logic, language, mathematics, etc., whereas the mode of operation of the right hemisphere is holistic, with limited language ability, responsible for our orientation in space, artistic endeavors, crafts, body image, recognition of faces, etc. Orstein (1972, pp. 50 - 51) underlines a series of additional distinct functions of the left and right hemispheres of the brain (corresponding to the left and right visual fields or parts of the body) such as feminine and masculine, dark side and lighter side, active and passive, logical and intuitive, mysterious and artistic.

Kimura (1973, pp. 70 - 78), Gazzaniga (1967, pp. 24 - 29), Sperry (1967, pp. 714 - 722), Restak (1976, p. 20) and Bogen and Bogen (1969, pp. 191 - 203), etc., have all conducted empirical studies pertinent to the unique functions of the left and right hemispheres of the human brain. The implications of their findings are obvious. The placement of visual materials within the concentrated space of the television screen based on these findings will enhance

our understanding of television images. For example, on the question of asymmetry of the screen: "Does placement of visual elements on the left and right side of the television screen differentially effect viewers' retention of visual content?" Metallinos & Tiemens' (1977, pp. 21 - 23) study has shown "some evidence suggesting that retention of visual information in a newscast is enhanced when the visual elements are placed on the left side of the television screen, a result which is consistent with those studies concerning the asymmetry of the human brain". Unsubstantiated by empirical evidence, some scholars have theorized that the opposite is true (Zettl, 1973, p. 129, Millerson, 1972, p. 292). But if the question of left versus right orientation in television images remains unresolved, Zettl's (1973), Millerson's (1972, and Dondis' (1973) theories on the various forces that operate within the television screen (all related to the function of the human brain) have not, as yet, begun to be challenged and varified or disputed empirically by visual communication researchers. The need to bridge scientific evidence provided by these neurological findings with subjective observation, comments and suggestions provided by the scholars of art composition and aesthetics is unquestionable.

3. How do the physiological properties of TV images influence the way viewers perceive them?

The physical characteristics of television images have been also overlooked by researchers, although they are closely related to viewers' perception, interpretation and response to television images. Such physical characteristics as (1) the light and color that make up the material of the television picture, (2) the relatively small size of the TV screen, (3) the viewing conditions including placement

of TV set, distance of viewing, immediate environment, etc., (4) the hypnotic effect of the TV picture, the physical influence of commercials in terms of motivation, motion, perception, etc., (5) the purely physiological needs such as relaxation, fulfilled by the sights and sounds of television, and (6) the rectangular shape of the television screen as opposed to any other geometrical pattern, must be considered as important factors in the study of visual images.

Theoretical concepts, sociological observations and subjective comments on the above characteristics are found in abundance in the literature of mass media and the viewer. But only a few attempts have been made to systematically examine and empirically test these observations.

Unlike other media, the TV picture is not simply reflected light, but actual light. What the viewer sees is light which physicists call visible radiant energy. The physical energy that viewers of a painting, for example, receive is different from that of a photograph of film picture. Viewing a television program (no matter what its content), Crown (1977, p. 17) suggests, is like sitting in front of a fireplace. He states that "Television's hypnotic effect can create a strange rapport between viewer and screen that is totally unrelated to program content".

Much has been theorized about aesthetic agents in television images, but little, if any, research has been done on the physiological implications of color television pictures. How do viewers perceive, interpret and respond to color television pictures? We know, for example, that a change of lighting effects the color temperature of the color TV picture, which, in turn, effects the viewers' perception of the television image. However, there are no true empirical studies in this area that measure these physiological effects.

In fact, we have reason to believe that the colors of the TV pictures are not truthful, reliable, or even harmless. For even the best television receivers distort colors perceptually, aesthetically and physiologically. Do light or dark, colored or plain walls, furniture, etc., influence the viewer's perception of TV images? It is expected that they all would have some effect on viewers, but limited empirical studies can be found to substantiate these hypotheses (Avery and Tiemens, 1975, p. 13).

Another physical characteristic of the TV picture is its size. Ordinary television sets present a relatively small picture which must be viewed from a fixed angle, distance and height (eye level). Discussing the proper TV monitor placement, viewing distance, and viewer position for best physical reception of television images, Meyer (1973, p. 4) states that: The farther away from the TV monitor, the less the resolution. Equally, the monitor height should be such that the top of a picture is not more than 30° above the viewer's eye level. The viewer should be seated not more than 30° off the monitor's center line for best viewing. Such viewing conditions are seldom reviewed and studied. (See Figure 5)

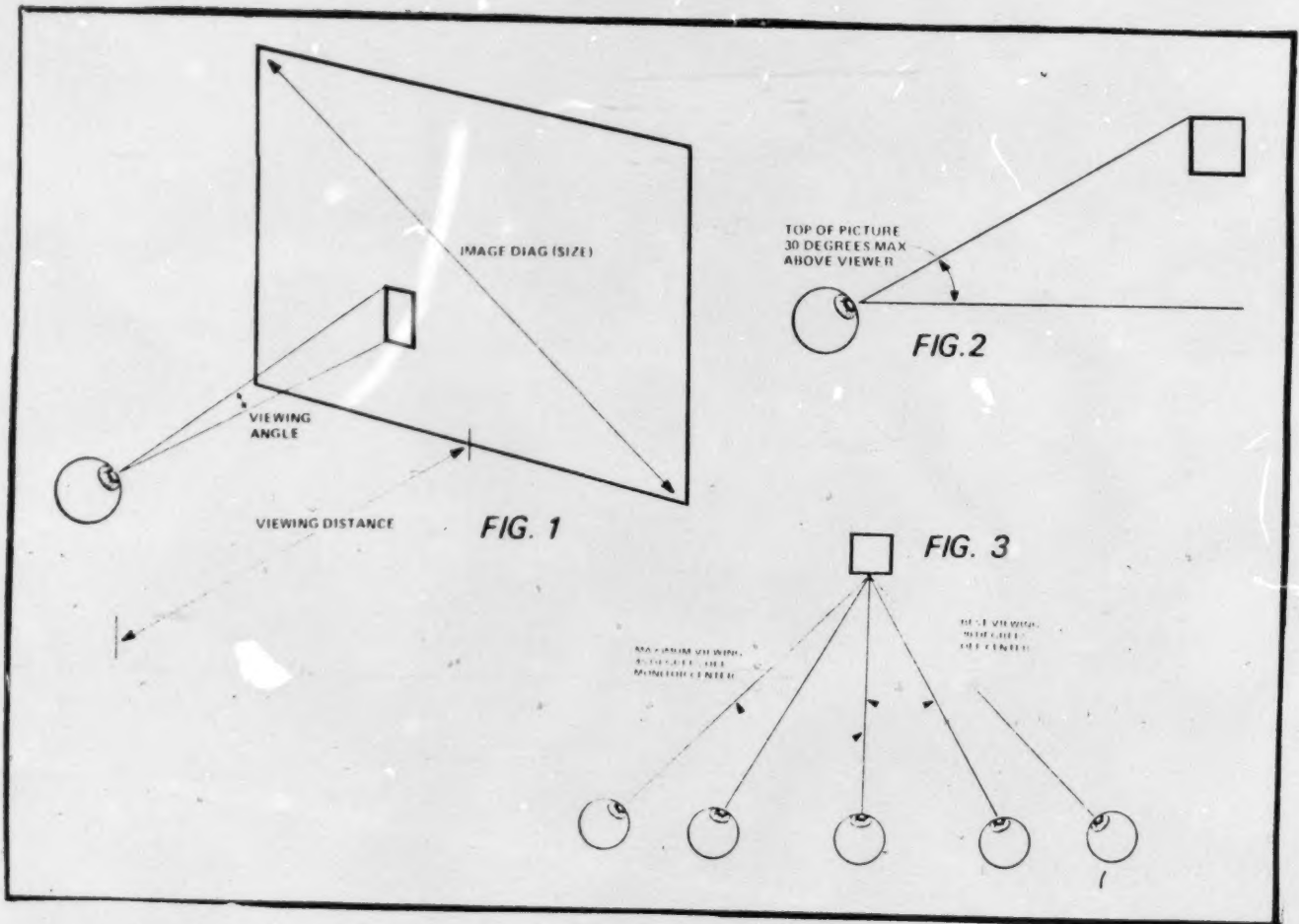


Figure 5. TV Monitor Placement(Meyer, p.4).

The small size of the TV screen and the relatively small angle and distance of viewing restricts the saccadic eye movements (the rapid exploratory movements of the eye), physiologically influencing, according to Crown(1977, p. 19), the viewers' perception of the television image. These viewing conditions are important variables, consistently present and always interacting, which obviously must be acknowledged and controlled by the researcher of visual communication via television pictures.

Some researchers have suggested that many viewers watch television for purely physiological or biological reasons totally unrelated to programming content. Robinson (1973, pp. 261 - 267), for example, found that television watchers sleep less than non-television watchers and one could conclude that television may provide some of the same physiological needs that sleep provides. Such an hypothesis, however, needs further verification.

Television commercials, in some cases, are not only louder than the regular program, but often appear brighter, with a faster pace and better produced than the programs they interrupt. This purely physiological characteristic embodied into television images definitely influences the way viewers respond to them. Empirical research in these cases is warranted.

4. What compositional factors determine the structure of TV pictures?

Although the subject of art composition and aesthetics is complex, since "aesthetic responses to visual stimuli are difficult phenomena to define and measure" (Avery & Tiemens, 1975, p. 1), the literature found in this area is quite extensive. Recently, the literature on visual communication referring primarily to viewers' interpretation and response to film and television images has been enhanced by the works of Arnheim (1969), Dondis (1973), and Zettl (1973). Their studies pose a series of questions. How do we construct visual images with aesthetic merit and maximum communicative effect? How do we place the visual elements within the confined space of the television screen for an intended aesthetic response? What are the compositional factors pertinent to the medium of television which we must consider? What specific factors determine the visual retention of the visual elements displayed on the TV screen?

Arnheim (1969, pp. V - XI), a perceptual psychologist, contends that the constructors, theorizers and evaluators of visual images should not ignore the principles of visual perception when they analyze and discuss the elements of balance, shape, form, growth, space, light, color, movement, tension, and expression. Although intuition and experience in visual thinking aid in the construction of visual images, empirical findings on visual perception should be considered by the image makers.

Dondis (1973, p. 181), an art designer for the most part, states:

To understand visual media, to express ideas in visual terminology, it will be necessary to study the components of visual intelligence, the basic elements, the syntactical structure, the perceptual mechanisms, the techniques, the styles, and systems. By studying them we control them, as man has learned to understand, control and use language. Then, and only then, will we achieve visual literacy.

According to Dondis (1973, pp. 39 - 66), the interpretation and evaluation of visual images should start with the study, control and understanding of the basic elements of visual communication. The "dot", the "line", the "shape", the "direction", the "tone", the "color", the "texture", the "scale", the "dimension" and the "movement".

Zettl (1973, pp. 11 - 13), a polymorphus artist (painter, musician, photographer, and television director), also recognizes the need to develop the language, the lexicon, of the television medium first, and then to discuss the structuring of sights, sounds and motion in order to accurately and systematically evaluate the effects of television images on the viewer. Along with Arnheim (1969), Dondis (1973) and Millerson (1972), Zettl (1973) has given us a plethora of theoretical concepts on the composition of the moving image (specifically TV images) which are awaiting the visual communication researcher's empirical verification, revision, modification and examination.

For example, the theoretical concepts centering on the subject of the active forces that operate within the concentrated space of the television screen (Zettl, 1973, pp. 116 - 149) such as (1) main direction, (2) magnetism of the frame and attraction of mass, (3) asymmetry of the frame, (4) figure-ground, (5) psychological closure and (6) vectore, should be verified empirically, as this author has suggested elsewhere (Metallinos, 1975).

At least one such field force, the asymmetry of the frame, has stimulated a series of empirical research studies such as (1) "The Syntax of Visual Messages: An Empirical Investigation of the Asymmetry of the Frame Theory" (Avery & Tiemens, 1975), (2) "Asymmetry of the Screen: The Effect of Left Versus Right Placement of Television Images" (Metallinos & Tiemens, 1977), (3) "Right and Left Asymmetry: Assessement of Magnitude Estimation" (Fletcher, 1977). The asymmetry of the screen issue is still debatable, and the problem is still unresolved. Empirical investigation of the field forces and other related issues is scarce.

Viewers' perception and response to television images often depends on the way pictures are structured. But since the factors that determine, for example, what parts of the TV picture are retained by the viewer, have not been empirically investigated, controlled and measured, a significant theory on this matter cannot be established. The need to conduct scientific investigations on existing observations and subjective comments concerning the specific factors that determine the structure of TV images is unquestionable.

Equally important factors that contribute significantly to the effective construction of TV images are symbolism and meaning assigned to pictures. The serious researcher of visual communication

should consider the works of Jung (1964), Kepes (1966), Jussin (1974), etc., as a starting point towards theory building and empirical investigation.

In summary, the present trend of research on viewers' perception of television images is based upon (1) the empirical findings of perceptual psychology which examines the path of visual perception and underlines the important variables involved in objective and pictorial seeing, (2) the scientific evidence of neurology which analyzes the function of the two hemispheres of the human brain and points out their particular tasks, (3) the studies on the physiological factors inherent in the medium of television which influence the viewers' perception of television images, and (4) the studies that underline the particular compositional factors that determine the effective structure of television images.

Conclusions

Empirical research on the subject of viewers' perception of television images is a complex undertaking. The failure of researchers to establish significant theories in this area is due to the fact that empirical findings on the related disciplines of perceptual psychology, neurology and physiology were either overlooked or underestimated. It is suggested that the construction of significant theories of television aesthetics, insofar as viewers' perception, interpretation and response are concerned, must be based on empirical research that relates scientific evidence with the mere observations, subjective statements and personal comments mostly found in studies on visual communication and art composition. Only then will the findings of these relationships lead us towards the

establishment of significant theories (suitable to empirical investigation) of television aesthetics which will broaden our knowledge and understanding of viewers' perception (and possibly interpretation and response) to television images.

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